

WHAT IS CLAIMED IS:

1. A radiation converting substrate constituted by forming a phosphor layer for converting a radiation into light and a moisture-preventing protective layer covering said phosphor layer, in  
5 succession on a substrate capable of transmitting the radiation:

wherein said moisture-preventing protective layer comprises a first plasma polymerization film  
10 formed from a monomer of a silane compound, and a second plasma polymerization film formed from a monomer of a fluorine-containing unsaturated hydrocarbon.

15 2. A radiation converting substrate according to claim 1, wherein said first plasma polymerization film and said second plasma polymerization film are laminated in succession on said phosphor layer.

20 3. A radiation converting substrate according to claim 2, wherein said fluorine-containing unsaturated hydrocarbon monomer includes 2 to 5 carbon atoms.

25 4. A radiation converting substrate according to claim 2, wherein said phosphor layer is constituted of an alkali halide and a light emission

activator.

5. A radiation image pickup apparatus formed by  
adhering a radiation converting substrate according  
5 to claim 1 and a sensor substrate including a  
photoelectric converting element.

6. A radiation image pickup apparatus  
constituted by forming a phosphor layer for  
10 converting a radiation into light and a moisture-  
preventing protective layer covering said phosphor  
layer in succession, either directly or across a  
protective layer, on a sensor substrate provided with  
a photoelectric converting element:

15 wherein said moisture-preventing protective  
layer comprises a first plasma polymerization film  
formed from a monomer of a silane compound, and a  
second plasma polymerization film formed from a  
monomer of a fluorine-containing unsaturated  
20 hydrocarbon.

7. A radiation image pickup apparatus according  
to claim 6, wherein said first plasma polymerization  
film and said second plasma polymerization film are  
25 laminated in succession on said phosphor layer.

8. A radiation converting substrate according

to claim 7, wherein said fluorine-containing unsaturated hydrocarbon monomer includes 2 to 5 carbon atoms.

5           9. A radiation converting substrate according to claim 7, wherein said phosphor layer is constituted of an alkali halide and a light emission activator.

10           10. A radiation image pickup system comprising:  
            a radiation image pickup apparatus according to claim 6;  
            signal processing means which processes a signal from said radiation image pickup apparatus;  
15           recording means which records a signal from said signal processing means;  
            display means which displays a signal from said signal processing means;  
            transmission means which transmits a signal  
20           from said signal processing means; and  
            a radiation source for generating said radiation.